The Emergence and Antimicrobial Resistance of *Salmonella* Serotype I 4,[5],12:i:- in the United States

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Background: Non-typhoidal *Salmonella* infections cause an estimated 1.4 million illnesses and 400 deaths in the U.S. annually. Among the > 2,500 serotypes of *Salmonella*, a monophasic *S.* Typhimurium variant (*S.* I 4,[5],12:i:-) recently emerged in Europe. To characterize *S.* I 4,[5],12:i:- epidemiology in the U.S., data were reviewed from 3 separate surveillance systems: the National *Salmonella* Surveillance System (NSSS), the Foodborne Diseases Active Surveillance Network (FoodNet), and the human and retail meat components of the National Antimicrobial Resistance Monitoring System (NARMS).

Methods: State public health laboratories serotype *Salmonella* isolates from clinics and report results to CDC via NSSS. Ten FoodNet sites interviewed patients infected with *S.* I 4,[5],12:i:- about international travel history. The susceptibility of NARMS human isolates was tested to 16 antimicrobial agents. Chicken breasts, ground turkey, ground beef, and pork chops were purchased at grocery stores in 8 states and tested for *Salmonella* in the NARMS/FoodNet Retail Food Study.

Results: *S.* I 4,[5],12:i:- increased from 0.2% (62/41,222) of *Salmonella* isolates reported in 1995 to 2.1% (739/35,662) in 2004. In 2004, only 1 of 124 patients interviewed reported international travel in the 7 days before illness onset. Of the 114 human *S.* I 4,[5],12:i:- isolates tested in NARMS, 1996-2003, 20 (18%) were resistant to at least one antimicrobial agent. Four were resistant to ceftiofur, a 3rd-generation cephalosporin, and 3 others were R-type ACSSuT. Of 365 meats positive for *Salmonella* in 2002-2003, 9 (3%) of 331 chicken breast and ground turkey products (but no beef or pork) yielded *S.* I 4,[5],12:i:-; no resistance was found in the 9 isolates.

Conclusions: *S.* I 4,[5],12:i:- is emerging in the U.S., although previous reporting practices limit precise trend description. Infections seem to be almost exclusively domestically acquired, and some isolates are highly resistant. Uniform laboratory-based surveillance is critical for monitoring *S.* I 4,[5],12:i:-and all emerging serotypes. Further studies should determine whether poultry and other food animals are reservoirs for this serotype and develop interventions.